REMARKS

Reconsideration of the above-identified application in view of the amendments above and the remarks following is respectfully requested.

A further set of the replacement drawings is provided.

Claims 42 and 46-50 have been rejected under 35 U.S.C. § 112 second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as being the invention.

The above amendments are believed to render each of the above claims allowable and overcome the above rejection.

Claims 1-8, 11-13, 15-21, 23-31, 34, 35; and 38-49 are rejected under 35 USC 103 as being rendered obvious in light of Bacus et al U.S. Patent 6,101,265 in view of Kley U.S. Patent 4,806,776. Bacus et al discloses imaging at low resolution over a relatively large area. The user finds a region of interest using a low resolution image, selects the region of interest using a marker or cursor and then is provided with a corresponding high resolution image of the region of interest. In the preferred embodiment the lower and higher resolution images are obtained using different power lenses on the same microscope. The imaging method is the same, and the only change is in the power of the lens used.

Kley discloses a system giving selectable illumination systems on a single microscope device for viewing an object under different desired illumination conditions. Kley therefore goes beyond Bacus in providing not just different resolution images of the same object, but images produced in different ways. However, because the images are produced in different ways, there is no integration between the different illumination systems. That is to say the different images produced are fully unconnected images and there is no possibility of selecting a co-ordinate in one image and finding the same region on the next. The reason for this is that the same object viewed under a different illumination system produces a different image. Different parts of the image show respectively high and low contrast and the physics of the light path may cause the same object to appear in a different place or at a different size. When Kley was originally filed, on March 10, 1980, image processing was in its relative infancy and there was no possibility of producing an automatic system that would solve the problem. The co-ordinate system disclosed in Bacus is not in any way intended to be applied to two separate and different images. Indeed, as disclosed in the abstract of Bacus, the low resolution image used for

selection is simply a computer generated low resolution version of the original image for which detail is required. The selection of the detail on the low resolution version of the image can additionally be used to control the microscope to look at different areas of the object, and apply all other variations available as standard to a microscope including changing of lenses etc. However the co-ordinate system of Bacus always applies only to a single image.

It is thus submitted that neither Kley nor Bacus disclose the key point that image location data is separately gathered during two different image gathering operations using different image gathering combinations in such a way as to collect location data so that the two images can be integrated using a single co-ordinate system. Such a point is believed to be clearly claimed in claim 1 and additionally emphasized using the new amendment specifying differences in illumination type and path. In the present invention, the location data is gathered using absolute location data based on the microscope and is thus independent of the image gathering method. The prior art neither discloses nor hints at such a way of overcoming the problem.

In the preferred embodiment the different methods are bright field and fluorescent modes, and it is clear that simple application of a co-ordinate system taken from a bright field mode could not simply be applied to a fluorescent mode image, as the combination of Bacus and Kley would suggest. Again it is emphasized that what the claim provides is for position data to be gathered independently with each mode of imaging and then integrated so that the images can be used together. What the combination of Bacus and Kley provides at the most is for co-ordinates gathered from a single image to be applied to navigating in a higher resolution version of the same image.

It is further pointed out that in the field of microscopy it is common to carry out investigations simultaneously using different imaging methods. Navigating between the different images is a task that has for many years had to be carried out manually and has been the bane of many biological researchers. The invention of Kley, made in 1980, allowed for different illumination methods to be available on the same device, but did not include any integration between the images. There has been a long-felt want for a solution that allowed automatic navigation between the different images, and the hardware of Kley has existed for twenty three years, yet the combination suggested by the Examiner, the co-ordinate system of Bacus with the multiple imaging of Kley was never made. The reason is believed to be because a

simple application of the co-ordinate system between the two images does not work. The images are different and therefore the co-ordinates are meaningless on the second image. The co-ordinates only become meaningful if based on either the intrinsic positioning of the imaging device (not on the images themselves at all) or on intrinsic structure which is constant throughout the imaging methods (claims 46 and 48). Without this realization there is no possibility of providing a useful device.

Considering now the remaining independent claims each in turn, independent claim 15 requires image location data to be gathered separately and independently for each image data acquisition method. This is neither disclosed nor suggested by the combination of Bacus and Kley, which rather suggest a single co-ordinate system applied from one image to the other.

Claim 30 requires that the first image data is stored with *field* location data. That is to say the location data relates to the positioning of the microscope relative to the object and is not co-ordinate data derived from the image. This allows the co-ordinate data to remain valid when used to navigate a separate image acquired using a different image gathering method. Again, this is neither disclosed nor suggested by the combination of Bacus and Kley, which rather suggest a single co-ordinate system applied from one image to the other.

Claim 38 has been amended to specify that the second image is also indexed, that is separately from the first, and then the indices are used to find matching images from the first and second sets. Again, this is neither disclosed nor suggested by the combination of Bacus and Kley, which rather suggest a single co-ordinate system applied from one image to the other.

Claim 39 specifies indexing of the first image in such a way as to find the second image. The imaging is carried out using different imaging systems such that there is no one-to-one correspondence between the images. Thus, unless the indexing is based on physical location there is no possibility that an index for the first imaging system will succeed in locating anything under the second imaging system. Again, this is neither disclosed nor suggested by the combination of Bacus and Kley, which rather suggest a single co-ordinate system applied from one image to the other.

Claims 40 and 42 specify that the identical positioning commands are used to gather data using different data gathering systems. The positioning commands are then used to identify the same locations using the two imaging systems. Thus, again, claim 42 goes beyond the combination of Bacus and Kley in providing the physical

positioning commands for the microscope as the common location system, thus allowing for integration between images gathered in different ways. Bacus and Kley do not between them explain how a single co-ordinate system can be used to integrate between two different image types because Kley makes no attempt to integrate between the two images and Bacus provides image based co-ordinates based only on a single image.

Claim 43 as amended explicitly details using a current imaging location as the index for the image in each respective system so as to allow integrated imaging between different imaging systems. Neither Bacus nor Kley, nor the combination of Bacus and Kley either teach or suggest using the physical reference as the index for the image to allow for integrated navigation between two images obtained using different imaging systems.

Claim 45 discloses imaging using each of two imaging systems and storing each image with *field location* data. That is to say it is the physical location that is stored and used as an integrated co-ordinate system for the different image types. Neither Bacus nor Kley, nor the combination of Bacus and Kley either teach or suggest using the physical reference as the index for the image to allow for integrated navigation between two images obtained using different imaging systems.

Claims 46 and 48 claim using edge detection to find structural features likely to be common to the images to provide an intrinsic co-ordinate system for all images produced by whatever system of the same object. The intrinsic co-ordinate system is then used for integrated navigation between such images. Neither Bacus nor Kley teach or suggest identifying structural features that are likely to be the same between two different images of the same object obtained from two different imaging systems. Neither Bacus nor Kley nor their combination even suggest an integrated co-ordinate system for different methods of imaging of any kind. Kley is the only citation that mentions the use together of images obtained using different types of image acquisition. However, at the time of filing of Kley, image processing was not sufficiently sophisticated to be able to carry out the edge detection task of claims 46 and 48 even if it had been suggested.

It is therefore concluded that the independent claims are both novel and inventive in light of the combination of Bacus and Kley and that the Examiner's objection is overcome.

The dependent claims are believed to be allowable as being dependent on allowable main claims.

Claims 9, 10, 22, 36 and 37 are rejected in light of the above combination of Bacus and Kley and additionally in light of Trulson. It is respectively submitted that the combination of Bacus and Kley fails to teach the use of a co-ordinate system independent of the imaging method, as discussed above, and that therefore these claims are allowable.

Claims 32 and 50 are rejected over the combination of Bacus and Kley and additionally in light of Spigarelli. It is respectively submitted that the combination of Bacus and Kley fails to teach the use of a co-ordinate system independent of the imaging method, as discussed above, and that therefore these claims are allowable.

Claim 33 is rejected over the combination of Bacus and Kley and additionally in light of Hellmuth. It is respectively submitted that the combination of Bacus and Kley fails to teach the use of a co-ordinate system independent of the imaging method, as discussed above, and that therefore these claims are allowable.

All of the matters raised by the Examiner have been dealt with and the rejections are believed to have been overcome. Thus the application is believed to be in order for allowance.

In view of the above amendments and remarks it is respectfully submitted that all the pending claims are all now in condition for allowance. Prompt notice of allowance is respectfully and earnestly solicited.

Respectfully submitted,

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